

What is claimed is:

1. A method for manufacturing a non-volatile memory device, comprising the steps of:

5 (a) forming an oxide layer on a substrate;

(b) implanting ions through the oxide layer to sequentially form a well in the substrate and a channel in the well;

(c) removing the oxide layer;

10 (d) depositing a tunnel oxide layer, a first polysilicon layer, and a nitride layer sequentially on the substrate;

(e) etching the nitride layer, the first polysilicon layer, the tunnel oxide layer and the substrate based on a shallow trench isolation pattern, resulting in a shallow trench in which the substrate is etched by a predetermined depth;

(f) filling the shallow trench with an isolation material;

20 (g) performing a polishing until the nitride layer is exposed to form a shallow trench isolation;

(h) removing the nitride layer to thereby protrude the shallow trench isolation; and

(i) depositing an oxide-nitride-oxide layer and a second polysilicon layer sequentially.

2. The method of claim 1, wherein the substrate is a silicon substrate.

3. The method of claim 1, wherein boron (B) and phosphor
5 (P) are implanted for forming the well and the channel in the step (b).

4. The method of claim 1, wherein the oxide layer is removed by a wet etch in the step (c).

10

5. The method of claim 1, wherein the polishing is performed by a chemical mechanical polishing in the step (g).

6. The method of claim 1, wherein the nitride layer is
15 removed by a wet etch in the step (h).